applies as well to species in which the female is the heterozygous sex as to those in which the male is heterozygous. The author does not hesitate to locate these factors in the chromosomes (though only one of them is in the X-chromosomes), and he is at considerable pains to show how this representation may be in harmony with the facts regarding several well-known cases of sex-limited inheritance. Crossing over (Morgan) is a modification of the regular process, but in no wise a contradiction.

Chapter XIII. is largely new. It relates to polymery, interference of genetic factors, sterility of hybrids and coupling of factors. Breeders, especially in Germany, come in for some sharp criticism for not adopting Mendelian methods and terminology. Inheritance in man is discussed in the final chapter of the book, which is new, and an extensive list of literature appearing from 1911 to 1913 is added to the old bibliography.

Numerous other changes, both additions and emendations, are made elsewhere. Many of these are made for pedagogical reasons. Some are of interest as indicating possible changes of the author's opinion. Thus, the author is now more inclined than formerly to regard the mutability of *Œnothera lamarckiana* as due to the hybridity of that species. He now leans more to the "Presence and Absence" theory of Bateson as representing the real truth. The chapter on inheritance of acquired characters is clarified, but the author's views are apparently little changed.

In a growing subject a book can scarcely be without errors. Thus, the four armadillo embryos of a litter are still referred to the first four blastomeres of the egg, whereas the reasons for so regarding them seem to have disappeared in the work of Patterson.[2] Typographical errors are few. Unfortunately, several of these have crept into the illustrations, but attention is directed to them in the legend.

The book is so good, however, that one can overlook its few faults. The new edition is plainly an improvement over the old. One could wish it were to be translated into English for the benefit of the American students who will not read it in the original.

A. Franklin Shull

[2] Patterson, J. T., *Jour. Morph.*, Vol. 24, No. 4, 1913, pp. 559–662.

Solvents, Oils, Gums, Waxes and Allied Substances. By Frederic S. Hyde, S.B. Consulting Chemist, New York. New York, Van Nostrand. 1913. Price $2.00.

These notes are for the use of factory chemists who wish a book on the subjects named which shall be condensed and authoritative.

The title suggests one of the good features of the book, that which gives the solvents for many of the substances mentioned; besides this, however, methods are given for the analysis of these compounds. In attempting to cover such a wide field it is not surprising that inaccuracies have crept in. For example, the statement regarding the Maumené-Sherman test (with sulphuric acid) is in error, as no dilution of the oil is necessary when using the ninety per cent. acid. The general unreliability of the Valenta test is not clearly stated. It is to be regretted that the "saponification equivalent" is again revived as it is infrequently met with at present. It should be noted that the New York State Tester is not commonly used for the ordinary lubricating oil—the Cleveland Cup is the one commonly employed. In the analysis of paints no reference is made to the use of the convenient centrifuge.

The book is one which will be very useful to all having to do with these substances.

A. H. Gill

SPECIAL ARTICLES

Adaptation of the Tamarisk for Dry Lands

Although a specialist in the line of cereal investigations, the writer has had occasion during the past ten years, in connection with grain experiments in dry-farming in the Great Plains and Western States, to observe the comparative adaptation to conditions of drought of various orchard and forest trees. While certain trees, such as the black and honey locusts, the elm, Osage orange, hack-

berry and Russian mulberry, are generally known to be adapted for dry-land farming, it is surprising to find that so little attention has been given to the tamarisk as a shrub, or small tree, suitable for hedges and shelter belts, though the experience of the writer has shown it to be absolutely unequaled for this purpose. Only four experiment stations at present come to mind where the tamarisk is grown at all, and, even in these places as a rule, only for ornament or as a curiosity. These are the New Mexico Experiment Station, the Hays Branch Experiment Station, in Kansas, the Arizona Experiment Station at Tucson, and the Fallon Experimental Farm on the Truckee-Carson Irrigation Project in Nevada. At the last named place, however, it is being employed experimentally and from a practical standpoint because of its qualities above mentioned.

It is peculiar that the tamarisk is listed by a number of nursery companies as an ornamental for the humid areas of eastern United States and is commonly employed in that way. Rarely is any mention made in nursery catalogues of its adaptability for dry-land conditions. The writer was made acquainted with its drought-resistant qualities accidentally through having obtained a single specimen for planting in a yard in the southwestern plains. It was soon found to be by far the most drought-resistant and otherwise hardy of all the trees and shrubs planted on the same land, including about twenty species. There appears to be no limit in dryness of the soil on any usual Great Plains' farm beyond which this plant will not survive. It is also best fitted for saline soils of all plants yet known to the writer. It has an extremely rapid growth, and, by branching out close to the ground, produces an excellent close hedge which will soon turn some kinds of stock even with its absence of thorns. None of the species known to the writer grow very tall, not ordinarily more than twenty feet, though two rather old specimens have been observed near the courthouse at Tascosa, Texas, 12 to 15 inches in diameter.

To the ordinary observer, not a specialist in botany, the plant is best described by saying that it most resembles asparagus. It has a tendency to make a very scraggy growth and will not grow erect with the lower limbs very far from the ground unless carefully and constantly pruned to that end. Botanically it belongs to the order Tamariscineæ. It bears very small scale-like leaves and small pink or white flowers, which are either four or five parted.

On the land above mentioned, situated in the western portion of the Texas Panhandle, the writer has tried the method (also suggested by the editor of *The Oklahoma Farm Journal*) of dividing cultivated ground into narrow fields several times as long as broad, extending with their greatest dimensions east and west, and planting narrow belts of trees on the south sides of these fields to check the blowing of the soil, which method, so far, is found to be excellent. The trees employed in planting these belts were usually black locust, honey locust, Osage orange and Russian mulberry, but it is now the practise to plant tamarisk as the first row on the south side of each of these belts.

An interesting thing about tamarisk, and of the greatest importance where these trees are adapted and where nursery stock is not easily obtained, is the fact that the plant can be readily and rapidly propagated by means of cuttings. After two or three years' growth, therefore, of from one to one dozen specimens there need be no further purchase of stock, as there is then plenty of material in the way of cuttings from these trees for all ordinary planting purposes. If advantage is taken of an opportunity to put the cuttings in the ground just after a rain, no further attention is needed other than good cultivation, and during an average season on the driest farms in the Great Plains the trees will thereafter succeed without any question.

In the Kew Index there are listed about seventy species of tamarisk which are found in various parts of the world, but none are native in North America and, apparently, only a half dozen at most are found in Europe. Alfred Rehder has given a good account of the genus

in Bailey's "Cyclopedia of Horticulture." The plant seems particularly at home in northern Africa and in the immense semi-arid and desert region comprising the Aralo-Caspian district, Russian Turkestan, Arabia, Persia, etc. The following eleven species are listed by nurserymen in this country, but the accuracy of the names is not yet determined: *Tamarix Parviflora, T. Algerica, T. Amurensis, T. Odessana, T. Chinensis, T. Gallica* and variety *Indica, T. hispida* (=*T. Kashgarica*), *T. juniperina* (=*T. Japonica* and *T. plumosa*), *T. tetrandra* and *T. Germanica. T. Germanica* and eight or nine others are now, however, referred to *Myricaria.*

The most common species in cultivation in this country appear to be *T. parviflora* and *T. gallica,* the latter originating in southern France. Discussions on the tamarisk have commonly referred to it as being of African origin. For our Great Plains and the drier portions of the western states most likely the species of Siberian origin would be best adapted. Numerous specimens have been introduced into this country by the U. S. Department of Agriculture, chiefly from China and Chinese Turkestan.

It is very important not to confuse the tamarisk with the tamarack, an extremely different plant, adapted in fact to marshes.

These few notes on the above subject are offered with the hope that interest will be stimulated in much more extensive plantings of this remarkable drought-resistant and alkali-resistant shrub in the districts in this country where it is adapted.

Mark Alfred Carleton
U. S. Department of Agriculture,
Washington, D. C.

FINANCIAL STATEMENT OF THE PERMANENT SECRETARY OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

L. O. Howard, Permanent Secretary, in account with the American Association for the Advancement of Science. From November 1, 1912, to October 31, 1913.

Dr.

To balance from last account:		$7,836.40
Admission fees	$2,760.00	
Annual dues, 1913	20,891.75	
ditto 1914	119.00	
ditto previous yrs.	302.00	
Associate fees	15.00	
Life membership fees.	800.00	
Publications	57.25	
Bindings	5.00	
Jane M. Smith Fund...	5,000.00	
Interest	78.69	
Unclassified receipts, including postage and Treasurer's payment on Science subscriptions for Life Members	615.53	30,644.22
		$38,480.62

Cr.

By publications:		
Publishers Science	$14,796.45	
Proceedings, Vol. 62..	1,901.09	$16,697.54
By expenses Cleveland meeting:		
Secretaries' expenses and commutations ..	540.09	
Badges, assistance and general expenses	115.71	655.80
By office expenses, including propaganda work:		
Postage	1,623.51	
Stationery, circulars and misc. printing	789.10	
Extra clerical help	653.85	
Engraving and printing certificates	105.00	
Telegrams, telephone, expressage, office supplies, etc.	463.25	3,634.71
By salaries:		
Permanent Secretary ..	1,500.00	
Assistant Secretary ...	1,500.00	3,000.00
By miscellaneous disbursements:		
To Treasurer (Jane M. Smith Fund)	5,000.00	
To Treasurer (life membership fees)	1,400.00	
To dues returned	13.00	6,413.00
By balance to new account..		8,079.57
		$38,480.62

The foregoing account has been examined and found correct, the expenditures being supported by proper vouchers. The balance of $8,079.57 is with the following Washington, D. C., banks:

American Security & Trust Co.	$3,994.11
American National Bank of Washington	4,085.46
	$8,079.57

(Sgd.) Theo. N. Gill,
Auditor

Smithsonian Institution,
Washington, D. C.